

In the Claims

Please amend the claims as follows.

1 Claims 1-65 (Canceled).

1 66. (Currently amended) A ~~CVD~~ system that acquires and analyzes spectral images of
2 a wafer ~~having one or more film properties prior to, during, and/or following a CVD~~
3 ~~process~~, the system comprising:
4 a plurality of stations ~~involved in performing one or more aspects of the CVD~~
5 ~~process~~;
6 a wafer transfer mechanism ~~disposed within the system~~ operable to transfer the
7 wafer between each of the plurality of stations;
8 means for illuminating an illumination source that illuminates the wafer while as
9 the wafer is transferred transferring between the plurality of stations;
10 a spectral imager ~~disposed~~ configured to detect light ~~from said illumination means~~
11 of the illumination source that is reflected from the wafer as the transfer mechanism is
12 transferring the wafer between the plurality of stations, and the spectral imager
13 configured to produce a plurality of one-dimensional spectral frames while said spectral
14 imager and the wafer undergo relative motion provided by said wafer transfer mechanism
15 using information of the light reflected from the wafer as the wafer is transferring
16 between the plurality of stations; and
17 a ~~processing means~~ circuitry for analyzing said plurality of one-dimensional
18 spectral frames, ~~where said processing means aggregates sequential~~ and aggregating at
19 least one of the one-dimensional spectral frames to form two-dimensional spectral images
20 and analyzes them.

1 67. (Currently amended) The system of claim 66, ~~where the one or more film~~
2 ~~properties is~~ wherein the wafer includes a substrate and at least one layer of at least one
3 thin film on the substrate, wherein the at least one thin film includes a plurality of
4 properties, wherein the plurality of properties comprise a thickness value of one of one of
5 ~~the one or more film layers~~ the at least one layer at one or more sites on the wafer.

1 Claim 68 (Canceled).

1 69. (Currently amended) A method of ~~obtaining and analyzing a spectral image of~~ for
2 imaging a wafer having one or more film layers ~~prior to, during, and/or following a CVD~~
3 ~~process, the method comprising the steps of:~~
4 illuminating the wafer with light;
5 positioning the wafer so that a ~~desired~~ portion of the wafer is illuminated;
6 detecting light reflected from ~~said desired~~ the portion of the wafer using a spectral
7 imager configured to produce a sequence of one-dimensional spectral frames while ~~said~~
8 the spectral imager and the wafer undergo relative motion provided by a transfer
9 mechanism ~~used to move wafers between one or more storage and one or more process~~
10 stations moving the wafer between a plurality of stations;
11 aggregating said sequence of one-dimensional spectral frames to form a two-
12 dimensional spectral image, and analyzing said two-dimensional image to determine a
13 film-layer property of the film layers.

1 70. (Currently amended) The method of claim 69, ~~where~~ wherein the film-layer
2 property is a thickness value of one of the one or more film layers at one or more sites on
3 the wafer.

1 Claim 71 (Canceled).

1 72. (Currently amended) A CMP system that ~~acquires and analyzes spectral images of~~
2 ~~a wafer having one or more film properties prior to, during, and/or following a CMP~~
3 ~~process, the system comprising:~~
4 a plurality of stations ~~involved in~~ for performing one or more aspects of the a
5 CMP process;
6 a wafer transfer mechanism disposed within the system to transfer the wafer
7 between said stations;
8 ~~means~~ a light source for illuminating the wafer while the wafer ~~is transferred~~
9 transfer mechanism is transferring the wafer between the stations;

10 a spectral imager disposed to detect light from ~~said illuminating means~~ the light
11 source that is reflected from the wafer and configured to produce a plurality of one-
12 dimensional spectral frames while said spectral imager and the wafer undergo relative
13 motion provided by said wafer transfer mechanism; and
14 means circuitry for processing said plurality of one-dimensional spectral frames,
15 ~~where said processing means~~ wherein the circuitry aggregates sequential one-dimensional
16 spectral frames to form a two-dimensional spectral image, and analyzes said two-
17 dimensional spectral image to determine one or more ~~film layer~~ properties of one or more
18 film layers of the wafer.

1 73. (Currently amended) The system of claim 72, ~~where~~ wherein the one or more ~~film~~
2 ~~layer~~ properties is include a thickness value of one of the one or more film layers at one
3 or more sites on the wafer.

1 Claim 74 (Canceled).

1 75. (Currently amended) ~~A method of obtaining and analyzing a spectral image of for~~
2 imaging a wafer having one or more film layers ~~prior to, during, and/or following a CMP~~
3 ~~process, the method comprising the steps of:~~
4 illuminating the wafer with light;
5 positioning the wafer so that a ~~desired~~ portion of the wafer is illuminated;
6 detecting light reflected from ~~said desired~~ the portion of the wafer using a spectral
7 imager configured to produce a sequence of spatially contiguous one-dimensional
8 spectral frames while said spectral imager and the wafer undergo relative motion
9 provided by a transfer mechanism used to move wafers between ~~one or more storage and~~
10 ~~one or more process stations; and~~
11 aggregating said frames to form a two-dimensional spectral image; ~~and~~
12 ~~analyzing said two-dimensional spectral image.~~

1 76. (Currently amended) The method of claim 75, ~~where~~ further comprising
2 analyzing the two-dimensional spectral image, wherein analyzing said two-dimensional

3 ~~spectral image~~ determines a film layer thickness value of one of the one or more films
4 film layers at one or more sites on the wafer.

1 Claim 77 (Canceled).

1 78. (Currently amended) A semiconductor wafer processing system that acquires and
2 analyzes spectral images of a wafer prior to, during, and/or following a process, the
3 system comprising:

4 a plurality of stations ~~involved in performing one or more aspects of the system~~
5 ~~process~~;

6 a wafer transfer mechanism disposed within the system to transfer the wafer
7 between the stations;

8 ~~means a light source~~ for illuminating the wafer while the wafer is transferred
9 between said stations;

10 a spectral imager disposed to detect light from ~~said illuminating means~~ the light
11 source that is reflected from the wafer, ~~and where said the~~ spectral imager is configured
12 to produce a plurality of one-dimensional spectral frames while said spectral imager and
13 the wafer undergo relative motion provided by said wafer transfer mechanism; and

14 a ~~processing means~~ processor for analyzing said plurality of one-dimensional
15 spectral frames, ~~where said processing means~~ wherein the processor aggregates
16 sequential one-dimensional spectral frames to form two-dimensional spectral images.

1 Claims 79 and 80 (Canceled).

1 81. (Currently amended) The system of claim 78, ~~where~~ wherein the process ~~is one~~
2 ~~of~~ includes one or more of a CVD process, a CMP process, or a stand-alone metrology
3 process.

1 82. (Currently amended) The system of claim 78, ~~where~~ wherein the stations include
2 one ~~of~~ or more of a load station, an unload station, or a process station.

1 83. (Currently amended) The system of claim 78, ~~where said illuminating means~~
2 wherein the lights source is either one of pulsed or continuous while said spectral imager
3 detects light.

1 84. (Currently amended) A semiconductor wafer processing system that provides and
2 analyzes spectral images of a wafer having one or more film layers prior to, during,
3 and/or following a process, the system comprising:
4 a wafer transfer mechanism disposed within the system to transfer the wafer
5 between a load station and a wafer chuck;
6 means a light source for illuminating the wafer while the wafer is transferred
7 between said load station and said wafer chuck;
8 a spectral imager disposed to detect light reflected from the wafer and configured
9 to produce a one-dimensional spectral frame while said spectral imager and the wafer
10 undergo relative motion of transferring the wafer; and
11 a processor that analyzes said one-dimensional frame.

1 Claims 85 and 86 (Canceled).

1 87. (Currently amended) A semiconductor wafer imaging system that acquires and
2 analyzes spectral images of a wafer having one or more film layers ~~prior to and/or~~
3 ~~following a process~~, the system comprising:
4 a first processing system that performs a first manufacturing step process on the
5 wafer;
6 a second processing system that performs a second manufacturing step process on
7 the wafer, where said second manufacturing step process follows said first manufacturing
8 step process;
9 a wafer transfer mechanism disposed to transfer the wafer between said first
10 processing system and said second processing system;
11 means a light source for illuminating the wafer while the wafer is transferred
12 between said first processing system and said second processing system;

13 a spectral imager disposed to detect light from ~~said illuminating means~~ the light
14 source that is reflected from the wafer during the transfer, and ~~where said spectral imager~~
15 ~~is configured to produce one-dimensional spectral frames; and~~
16 means circuitry for aggregating said one-dimensional spectral frames to form a
17 two-dimensional spectral image and analyzing said two-dimensional spectral image to
18 determine a film layer property of the one or more film layers.

1 88. (Currently amended) The system of claim 87, ~~where~~ wherein the one or more film
2 layer properties ~~is~~ include a thickness value of one of the one or more film layers at one
3 or more sites on the wafer.

1 89. (Currently amended) A method of obtaining and analyzing a spectral image of a
2 wafer having one or more film layers ~~between two wafer manufacturing processes~~, the
3 method comprising ~~the steps of:~~
4 securing the wafer from a first processing system using a transfer mechanism ~~to~~
5 ~~secure the wafer from a first processing system that performs a first manufacturing step~~
6 ~~on the wafer;~~
7 illuminating the wafer with light from a light source;
8 positioning the wafer using said transfer mechanism so that a desired portion of
9 the wafer is illuminated by light from said light source;
10 detecting light reflected from said ~~desired~~ portion of the wafer using a spectral
11 imager configured to produce a sequence of contiguous one-dimensional spectral frames
12 while said transfer mechanism moves the wafer;
13 aggregating said sequence of contiguous one-dimensional spectral frames to form
14 a two-dimensional spectral image;
15 analyzing said two-dimensional image to determine one or more film layer
16 properties of the one or more film layers; and
17 transferring the wafer to a second processing system ~~that performs a second~~
18 ~~manufacturing step on the wafer.~~

1 90. (Currently amended) The method of claim 89, ~~where~~ wherein the one or more
2 film layer properties ~~is~~ include a thickness value of one of the one or more film layers at
3 one or more sites on the wafer.

1 Claims 91-155 (Canceled).